

REMARKS/ARGUMENTS

Claims 1 and 7 have been amended herein and new claims 19 and 20 have been added. Support for the new claims is found at paragraph [0020] of the as-filed application. No new matter has been added.

The Office Action mailed December 3, 2003, has been received and reviewed. Claims 1-18 are currently pending in the application. Claims 1-18 stand rejected. Applicant has amended claims 1 and 7, added new claims 19 and 20, and respectfully requests reconsideration of the application as amended herein.

Information Disclosure Statement(s)

Applicant notes the filing of an Information Disclosure Statement on November 25, 2003, and notes that no copy of the PTO-1449 was returned with the outstanding Office Action. Applicant respectfully requests that the information cited on the PTO-1449 be made of record herein.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on the Admitted Prior Art in view of U.S. Patent No. 3,699,210 to Binning et al. and U.S. Patent No. 3,573,086 to Lambdin Jr.

Claims 1-6 and 13-15 stand rejected under 35 U.S.C. § 103(a) ("Section 103") as being unpatentable over the admitted prior art in view of U.S. Patent No. 3,699,210 to Binning *et al.* ("Binning") and U.S. Patent No. 3,573,086 to Lambdin Jr. ("Lambdin"). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103 rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The obviousness rejections of claims 1-6 and 13-15 are improper because the cited references do not provide a motivation to combine to produce the claimed invention. To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must "suggest the desirability of the combination" or provide "an objective reason to combine the teachings of the references." M.P.E.P. § 2143.01. In addition, "it is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence." *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed. Cir. 2002). This evidence "must be based on objective evidence of record." *Id.* at 1343. When patentability depends on a question of obviousness, "rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references" is "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis." *Id.* This rigorous showing requires the Examiner to "explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious." *Id.* In other words, the motivation to combine can not "be resolved on subjective belief and unknown authority." *Id.* at 1344. Furthermore, the Examiner "cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." *Id.* at 1345.

Binning discloses a method of carbonizing fibers, such as aromatic polyamide fibers. The fibers are first pretreated by heating at a temperature of 180°C-550°C in an oxygen-containing environment for an amount of time sufficient to blacken the fibers. The blackened fibers are then heated in a laser beam in a non-oxidizing environment at a temperature from 700°C-1200°C for longer than one-tenth of a second.

Lambdin discloses an ablation-resistant structure having fibers of carbon or graphite that are bonded in a carbonized binder. The fibers include cellulosic materials, such as rayon or cotton. Rayon yarn having a denier of 2.29 is used to produce graphite fibers that are 10 mm in length and 5 mm in diameter.

Binning does not teach or suggest the limitation of “providing a precursor material comprising at least one aromatic polyamide, the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber,” as acknowledged by the Examiner. Office Action of December 3, 2003, p. 3. The admitted prior art also does not teach or suggest this limitation. Therefore, the Examiner relies on Lambdin as teaching this limitation. However, Lambdin discloses rayon fibers having a denier of 2.29 and does not teach or suggest using fibers of an aromatic polyamide. As such, Lambdin does not teach or suggest “providing a precursor material comprising at least one aromatic polyamide, the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber,” as recited in claim 1.

The Examiner states that “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use 2.3 denier fiber to form the reinforcement since this denier reinforcement has been used previously in carbonized impregnated fiber composites used in rocket nozzles.” Office Action of December 3, 2003, p. 3. However, the Examiner’s reasons are conclusory and are not based on objective evidence of record. The cited references, when combined, do not suggest the desirability of the combination or provide an objective reason to combine the teachings of the references. Specifically, none of the admitted prior art, Binning, or Lambdin suggest providing a precursor material that comprises at least one aromatic polyamide and has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. The admitted prior art does not suggest using an aromatic polyamide and, therefore, necessarily does not suggest the recited denier per fiber of the aromatic polyamide. While Binning discloses using an aromatic polyamide, Binning does not suggest that the aromatic polyamide has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. Finally, Lambdin does not suggest using an aromatic polyamide as the precursor material and, therefore, necessarily does not suggest the recited denier per fiber of the aromatic polyamide.

The knowledge of a person of ordinary skill in the art also does not suggest the desirability of the combination or provide an objective reason to combine the teachings of the references. The Examiner states that since a reinforcement having this denier has been used previously, it would be obvious to use a 2.3 denier fiber to form the claimed invention. However, the reinforcement referred to by the Examiner is formed with a rayon material and is not formed from an aromatic polyamide material. As such, the Examiner has not provided an objective reason for providing a precursor material that comprises an aromatic polyamide having the recited denier per fiber range. In other words, the Examiner's reasons do not support combining the cited references to produce the claimed invention.

Since the cited references do not provide a motivation to combine to produce the claimed invention, the obviousness rejection of claim 1 is improper and should be withdrawn.

Claims 2-6 and 13-15 are allowable, *inter alia*, as depending from allowable claim 1.

Obviousness Rejection Based on the Admitted Prior Art, Binning, and Lambdin and further in view of U.S. Patent No. 3,576,769 to Hirsch et al.

Claims 7-12 and 16-18 stand rejected under Section 103 as being unpatentable over the admitted prior art, Binning, and Lambdin, and further in view of U.S. Patent No. 3,576,769 to Hirsch *et al.* ("Hirsch"). Applicant notes that the Examiner's rejections described in Points 3 and 5 of the outstanding Office Action appear to be the same. Office Action of December 3, 2003, p. 3-4 and p. 5-6. Therefore, the rejections in Points 3 and 5 are addressed together. Applicant respectfully traverses this rejection, as hereinafter set forth.

The obviousness rejections of claims 7-12 and 16-18 are improper because the cited references do not provide a motivation to combine to produce the claimed invention.

The teachings of Binning and Lambdin are as previously summarized.

Hirsch discloses a method of semicarbonizing an aromatic polyamide by exposing the aromatic polyamide to a moderate temperature over an extended time period. To semicarbonize the aromatic polyamide, the temperature is slowly raised from 25°C to 250°C or 500°C over a time period of 45-60 minutes. Hirsch also discloses that exposing the aromatic polyamide to higher temperatures, such as those required to carbonize the aromatic polyamide, causes products

including the aromatic polyamide to become embrittled and weak. The products obtained by the method of Hirsch include semicarbonized aromatic polyamides and the properties of these products are distinguished from the properties of products produced by a carbonizing process.

The admitted prior art, Binning, and Hirsch do not teach or suggest “providing a precursor material comprising at least one poly(meta-arylaramid), the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber,” as recited in claim 7. Neither the admitted prior art nor Binning teaches or suggests this limitation for substantially the same reasons discussed above in the obviousness rejection of claim 1. In addition, neither the admitted prior art nor Binning discloses using poly(meta-arylaramid) as the precursor material. While Hirsch discloses using a poly(meta-arylaramid), Hirsch does not teach or suggest that the poly(meta-arylaramid) has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. As such, Hirsch does not cure the deficiencies in the admitted prior art and Binning.

The Examiner relies on Lambdin as teaching the recited denier per fiber range. However, as previously discussed, Lambdin discloses rayon fibers having a denier of 2.29 and does not teach or suggest using an aromatic polyamide as the precursor material. As such, Lambdin necessarily does not teach or suggest that the aromatic polyamide has “a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber,” as recited in claim 7. However, the Examiner states that “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use any type of polyaramid such as NOMEX as the polyaramid in the admitted prior art, Binning et al., and Lambdin, Jr. since Binning et al. discloses using polyaramids having phenylene which are not ortho, since Binning et al. does not indicate only specific polyaramids can be used, and since Hirsch et al. shows that NOMEX is known in the art as a heat-resistant material.” Office Action of December 3, 2003, p. 3-4.

However, this statement by the Examiner is conclusory and is not based on objective evidence of record. Nothing in the cited references, when combined, suggests the desirability of the combination or provides an objective reason to combine the teachings of the references. Specifically, the admitted prior art, Binning, Lambdin, and Hirsch do not suggest providing a precursor material that comprises at least one poly(meta-arylaramid) and has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. The admitted prior art does not suggest

using a poly(meta-arylaramid) and, therefore, necessarily does not suggest the recited denier per fiber of the poly(meta-arylaramid). While Binning discloses using an aromatic polyamide, it does not suggest that the aromatic polyamide is a poly(meta-arylaramid) or that the poly(meta-arylaramid) has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. Lambdin also does not suggest using a poly(meta-arylaramid) as the precursor material and, therefore, necessarily does not suggest the recited denier per fiber of the poly(meta-arylaramid). Finally, while Hirsch discloses using a poly(meta-arylaramid), Hirsch does not suggest that the poly(meta-arylaramid) has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber.

The knowledge of a person of ordinary skill in the art also does not suggest the desirability of the combination or provide an objective reason to combine the teachings of the references. The Examiner states that it would be obvious to use any polyaramid in the claimed invention because Binning discloses using polyaramids having phenylenes that are not ortho and does not indicate that specific polyaramids are used. However, the Examiner's reasons are conclusory and are not based on objective evidence of record. As a first point, Applicant notes that Binning discloses using aromatic polyamides that have a certain structure, as shown in Column 1, lines 35-45. Therefore, contrary to the Examiner's assertion, Binning indicates that specific aromatic polyamides are used as precursor fibers. In addition, contrary to the Examiner's assertions, merely because Binning discloses using phenylenes that are not ortho does not render it obvious to use any polyaramid in the claimed invention. Furthermore, while Binning discloses using phenylenes that are not ortho, Binning provides no specific suggestion that a poly(meta-arylaramid) should be used and, therefore, provides no motivation to use a poly(meta-arylaramid).

In addition, Hirsch teaches away from combination with the cited references. Hirsch discloses semicarbonizing (partially carbonizing) aromatic polyamide fibers to produce aromatic polyamide fibers that are non-flammable, thermally stable, chemically inert, and exhibit good dimensional stability at elevated temperatures. Hirsch also states that if the aromatic polyamide fibers are carbonized, rather than being semicarbonized, the aromatic polyamide fibers become weak and embrittled. Since the teachings of Hirsch relate to semicarbonizing the aromatic

polyamide fibers and disclose that carbonizing the aromatic polyamide fibers is undesirable, Hirsch teaches away from combination with the cited references.

Since the cited references do not provide a motivation to combine, the obviousness rejection of claim 7 is improper and should be withdrawn.

Claims 8-12 and 16-18 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Binning in view of the Admitted Prior Art and Lambdin

Claims 1-7 and 13-15 stand rejected under Section 103 as being unpatentable over Binning in view of the admitted prior art and Lambdin. Applicant respectfully traverses this rejection, as hereinafter set forth.

The obviousness rejection of claim 1 is improper because the cited references do not provide a motivation to combine to produce the claimed invention for substantially the same reasons discussed in the obviousness rejection of claim 1. As such, the rejection should be withdrawn.

Claims 2-6 and 13-15 are allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons discussed above.

The obviousness rejection of claim 7 is improper because the cited references do not teach or suggest all the limitations of claim 7 and do not provide a motivation to combine to produce the claimed invention. Specifically, the cited references do not teach or suggest "providing a precursor material comprising at least one poly(meta-arylaramid), the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber." As previously discussed, the admitted prior art and Binning do not teach or suggest using a poly(meta-arylaramid). Therefore, the admitted prior art and Binning necessarily do not teach or suggest that the poly(meta-arylaramid) has a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber. Lambdin also does not teach or suggest this limitation because Lambdin only discloses a rayon material. As such, Lambdin does not teach or suggest using a poly(meta-arylaramid) having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber.

The cited references do not provide a motivation to combine for substantially the same reasons as discussed above in the obviousness rejection of claim 1.

Since the cited references do not teach or suggest all the limitations and do not provide a motivation to combine, the obviousness rejection of claim 7 is improper and should be withdrawn.

NEW CLAIMS

Applicant has added new claims 19 and 20, which are believed to be allowable in view of the art of record.

ENTRY OF AMENDMENTS

The amendments to claims 1 and 7 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Applicant respectfully asserts that no surrender or disclaimer of claim scope, and more specifically, of the broadest possible range of equivalents to which Applicant may be entitled has been effectuated.

CONCLUSION

Claims 1-20 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, she is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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